GPMEliminator
SOLID PUMPING SOLUTIONS

User's Manual

12/11/2014

Draft Rev. – TS 141211

GPMEliminator™
SOLID PUMPING SOLUTIONS

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Getting Started

Website

Please note that access may be limited for Non-licensed users. Please contact GPM 1-800-754-9904 or your GPM sales team for assistance in choosing the best solution for your application.

Licensed users can access the Intelliquip website by going to http://gpm.intelliquip.com

Non-licensed users (end users) can access the Intelliquip selection tool by going to www.gpmco.com . The customer will have to enter some credentials in order to access the tool.

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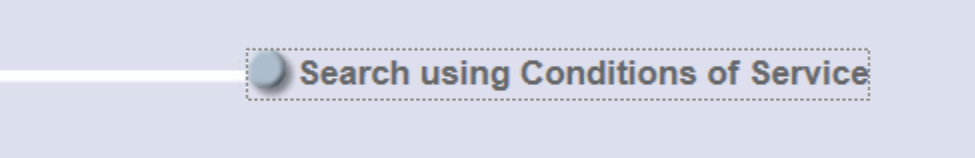
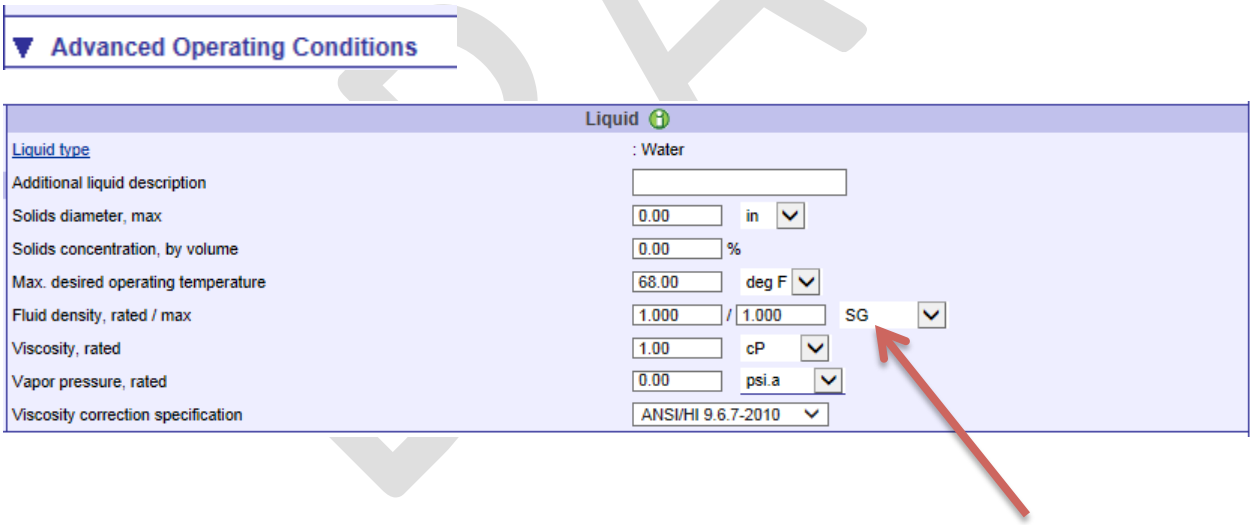
Using the Selector



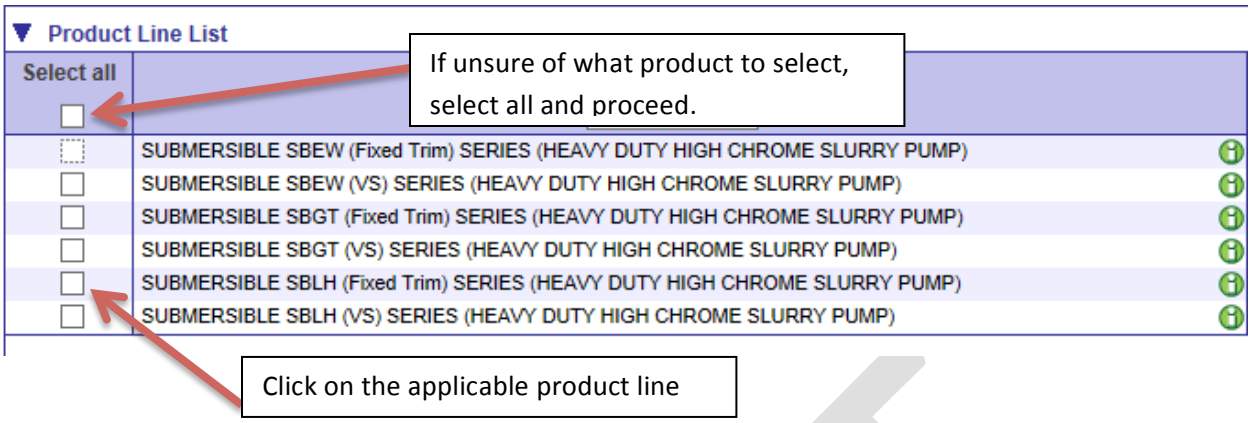
Under basic Operating Conditions input the flow and head for the desired conditions.

Under Advanced Operating Conditions, input the specific gravity if greater than 1.



Once the applicable information has been typed in click the next button:

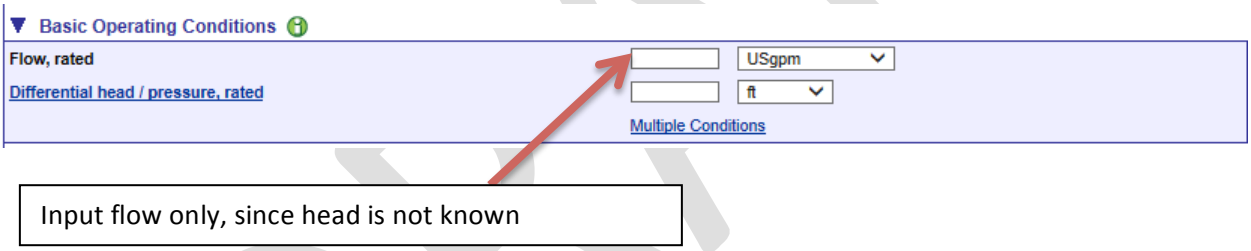
Select the applicable product line(s):


Product Line List
Select all
If unsure of what product to select, select all and proceed.
SUBMERSIBLE SBEW (Fixed Trim) SERIES (HEAVY DUTY HIGH CHROME SLURRY PUMP)
SUBMERSIBLE SBEW (VS) SERIES (HEAVY DUTY HIGH CHROME SLURRY PUMP)
SUBMERSIBLE SBGT (Fixed Trim) SERIES (HEAVY DUTY HIGH CHROME SLURRY PUMP)
SUBMERSIBLE SBGT (VS) SERIES (HEAVY DUTY HIGH CHROME SLURRY PUMP)
SUBMERSIBLE SBLH (Fixed Trim) SERIES (HEAVY DUTY HIGH CHROME SLURRY PUMP)
SUBMERSIBLE SBLH (VS) SERIES (HEAVY DUTY HIGH CHROME SLURRY PUMP)
Click on the applicable product line

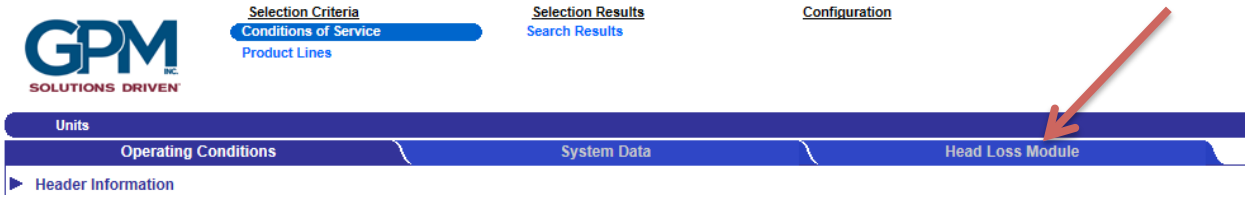
VS stands for variable speed option, only select if the customer is running or willing to run a VFD in the application.

Once the products are selected, click the next button:

Flow Provided with System Layout



Click on Head Loss Module



By clicking on the head loss module, the browser will open a new page to input information to calculate the head loss given the system design information, pipe, valves, fittings, static head, etc.....

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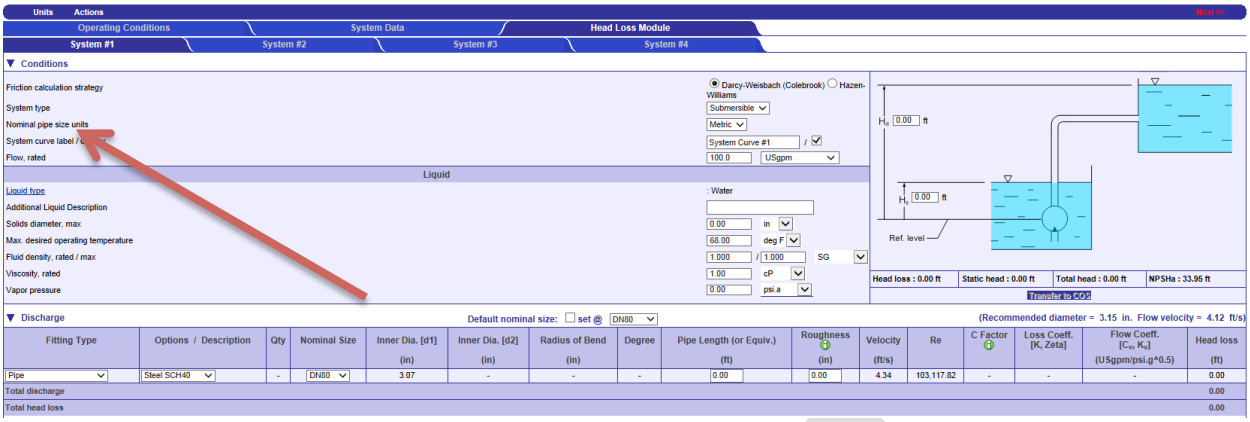
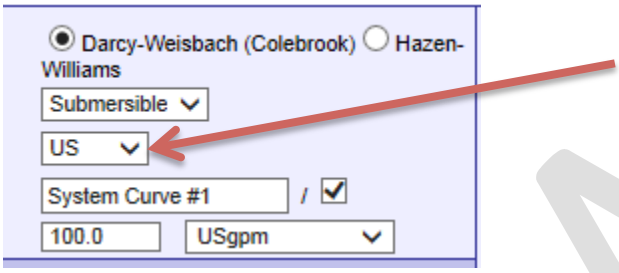
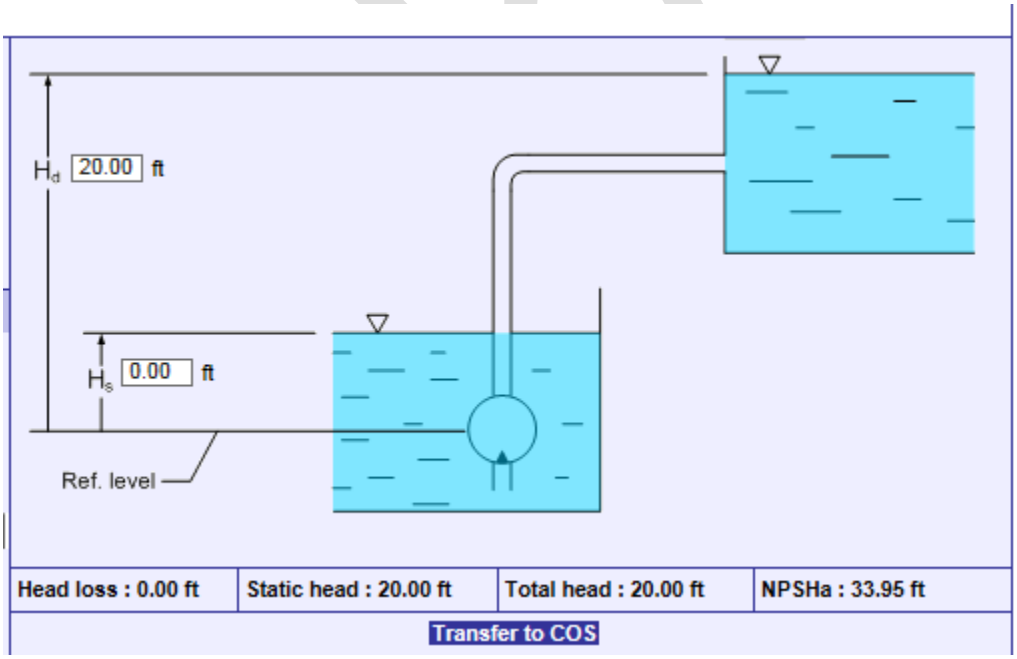


Verify that the pipe size units are US.



Start by putting in the elevation differences, if not sure leave the lower one 0 and the upper one to match the system vertical rise



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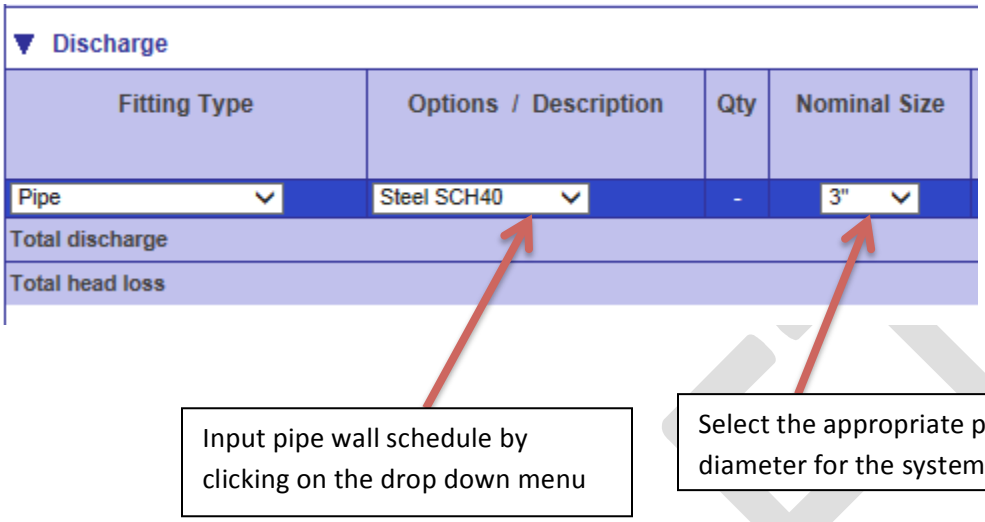
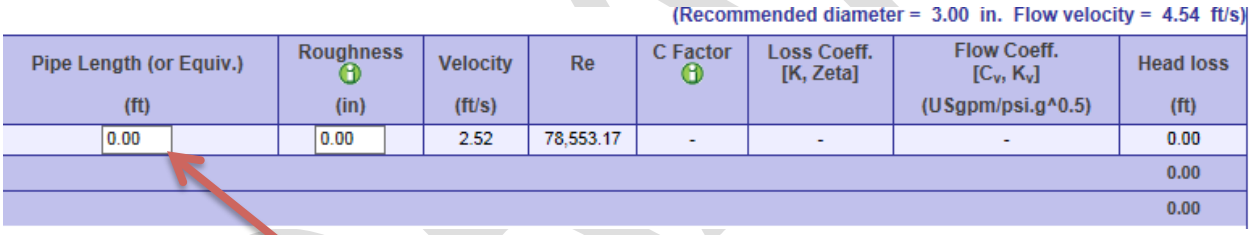
Once the static head has been put in, click on Recalculate

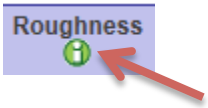
Then select the type of pipe



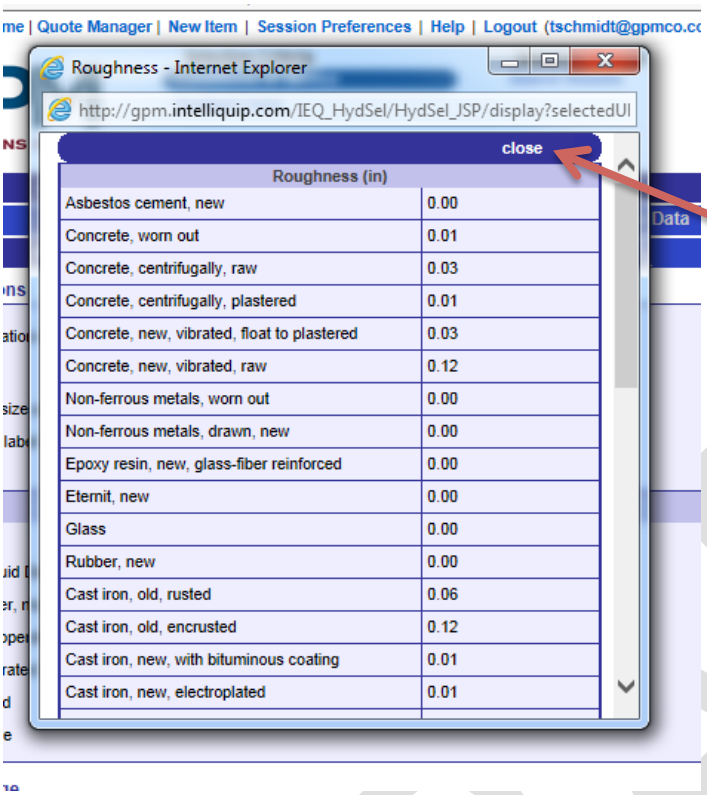
Input the amount of TOTAL pipe length between pump discharge and system discharge



Input the Roughness, if the roughness is not given to you click on the green info button



A window will pop open once the green info button is clicked. This will display a number of differend roughness values for a number of different piping configurations.


me | Quote Manager | New Item | Session Preferences | Help | Logout (tschmidt@gpmco.c
Roughness - Internet Explorer
http://gpm.intelliquip.com/IEQ_HydSel/HydSel_JSP/display?selectedUI
close
Roughness (in)
Asbestos cement, new 0.00
Concrete, worn out 0.01
Concrete, centrifugally, raw 0.03
Concrete, centrifugally, plastered 0.01
Concrete, new, vibrated, float to plastered 0.03
Concrete, new, vibrated, raw 0.12
Non-ferrous metals, worn out 0.00
Non-ferrous metals, drawn, new 0.00
Epoxy resin, new, glass-fiber reinforced 0.00
Eternit, new 0.00
Glass 0.00
Rubber, new 0.00
Cast iron, old, rusted 0.06
Cast iron, old, encrusted 0.12
Cast iron, new, with bituminous coating 0.01
Cast iron, new, electroplated 0.01
Data

Select the most appropriate pipe style for application and type that value in the roughness box, and select Close when finished.

(Recommended diameter = 3.00 in. Flow velocity = 4.54 ft/s)

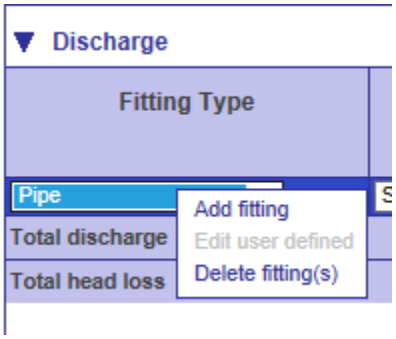
Pipe Length (or Equiv.) (ft)	Roughness (in)	Velocity (ft/s)	Re	C Factor	Loss Coeff. [K, Zeta]	Flow Coeff. [C_v, K_v] (USgpm/psi.g^0.5)	Head loss (ft)
0.00	0.00	2.52	78,553.17	-	-	-	0.00
							0.00
							0.00

Once the roughness has been typed into the box, click on Recalculate

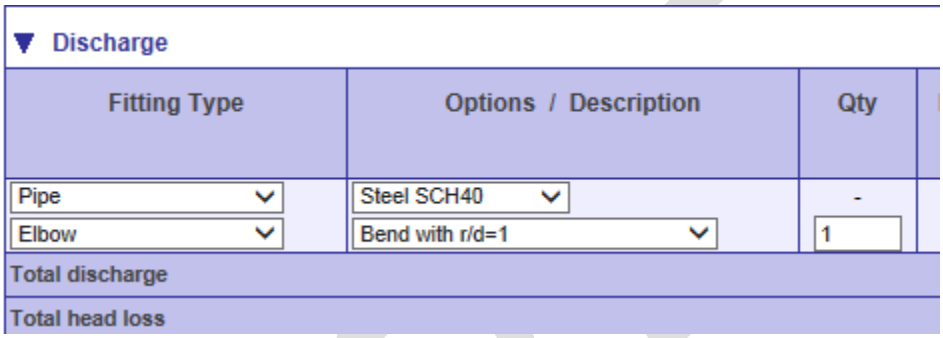
Pipe Length (or Equiv.) (ft)	Roughness (in)	Velocity (ft/s)	Re	C Factor	Loss Coeff. [K, Zeta]	Flow Coeff. [C_v, K_v] (USgpm/psi.g^0.5)	Head loss (ft)
500.0	.001	2.52	78,553.17	-	-	-	2.84
							2.84
							2.84

Now the module will calculate and display the head loss for the given information.

To add fittings and other features “RIGHT” click on the drop down that displays “Pipe” under fitting type



Click on add fitting, and a line item will display below the pipe.



Continue to complete the above steps until all system parameters, fittings, and elevation changes are accounted for.

The final total head loss will be displayed

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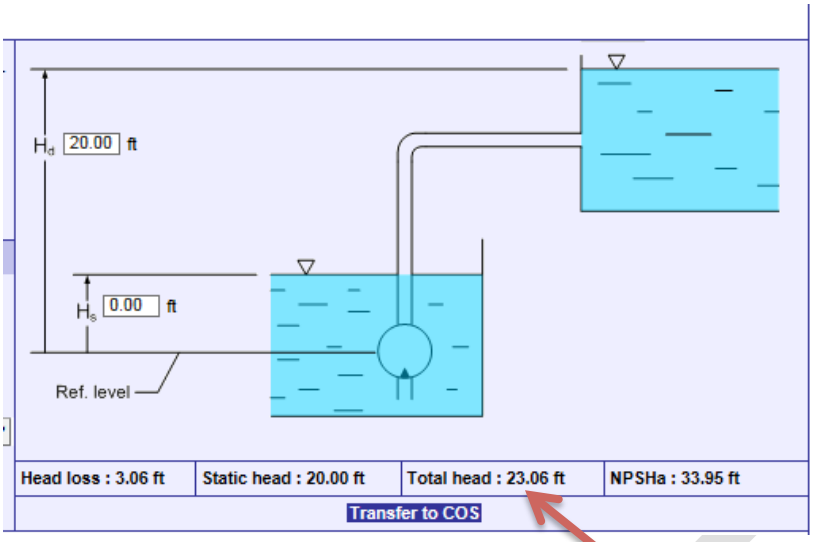
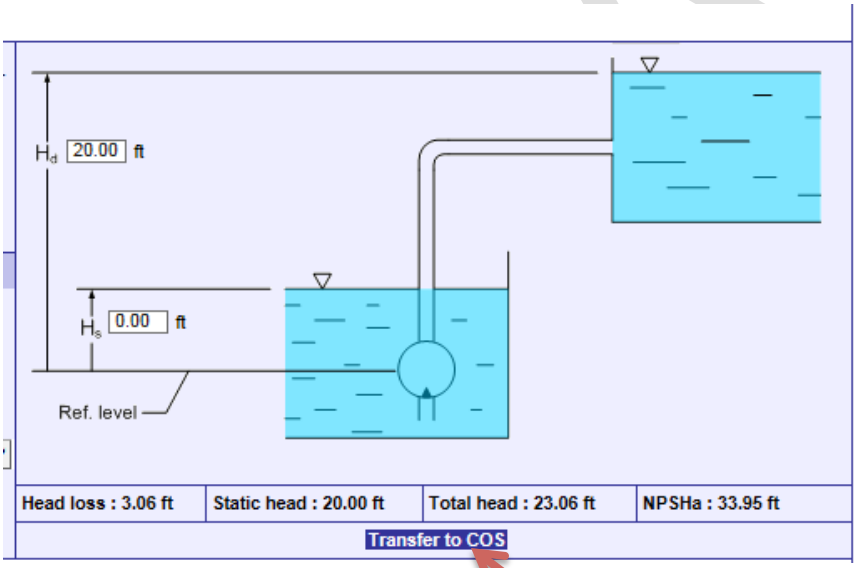
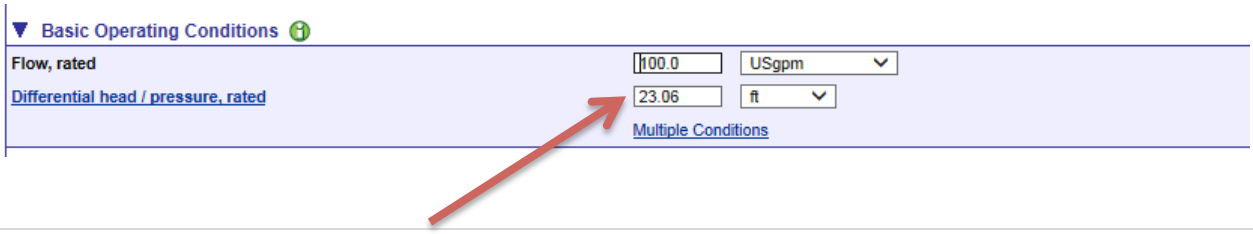
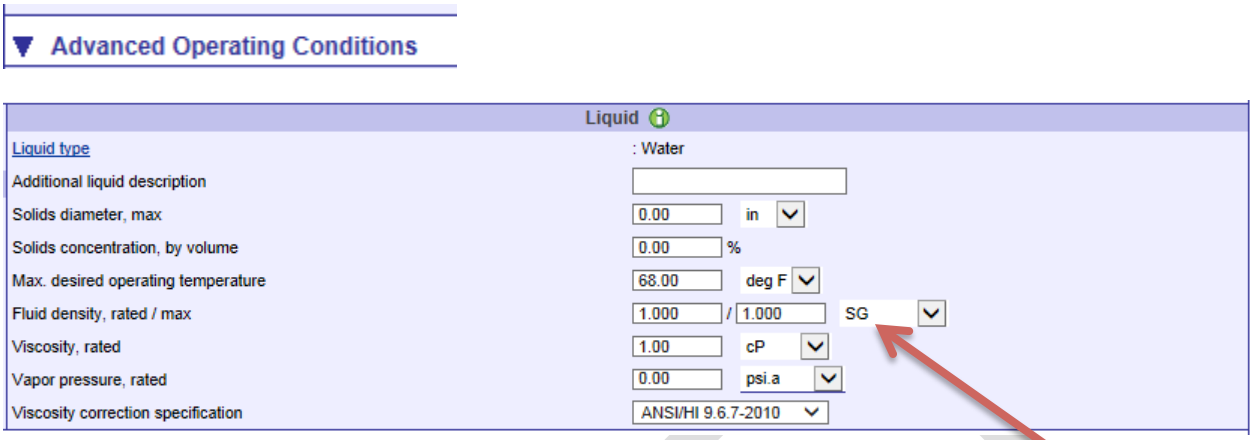


If everything looks good, then click on Transfer to COS and this will put the new calculated head loss into the search conditions.



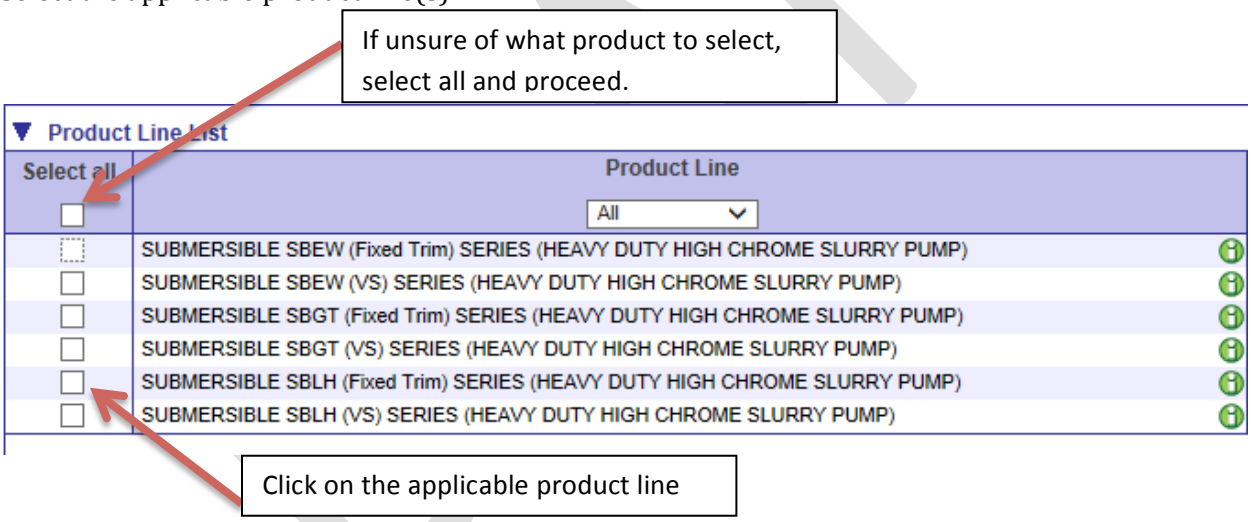


Under Advanced Operating Conditions, input the specific gravity if greater than 1.



Once the applicable information has been typed in click the next button: Next >>

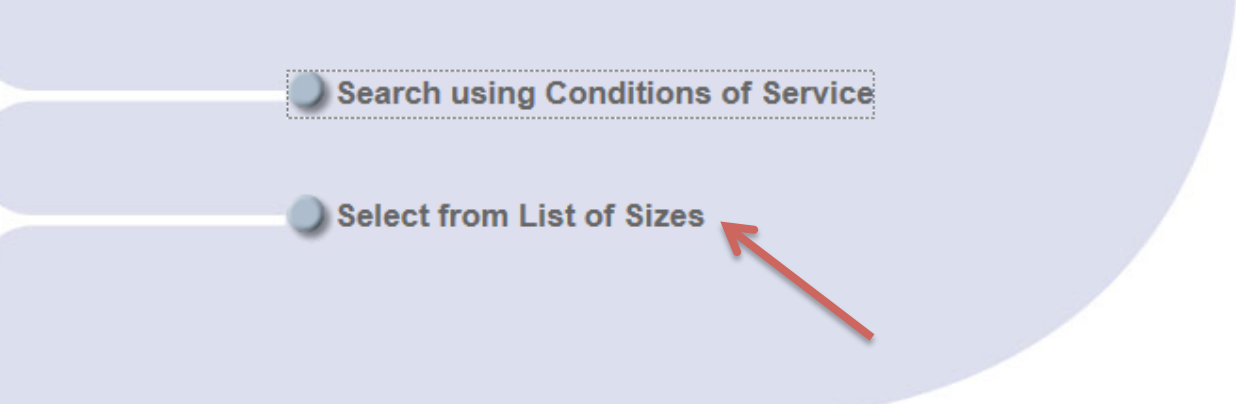
Select the applicable product line(s):


If unsure of what product to select, select all and proceed.
Product Line List
Select all
Product Line
All
SUBMERSIBLE SBEW (Fixed Trim) SERIES (HEAVY DUTY HIGH CHROME SLURRY PUMP)
SUBMERSIBLE SBEW (VS) SERIES (HEAVY DUTY HIGH CHROME SLURRY PUMP)
SUBMERSIBLE SBGT (Fixed Trim) SERIES (HEAVY DUTY HIGH CHROME SLURRY PUMP)
SUBMERSIBLE SBGT (VS) SERIES (HEAVY DUTY HIGH CHROME SLURRY PUMP)
SUBMERSIBLE SBLH (Fixed Trim) SERIES (HEAVY DUTY HIGH CHROME SLURRY PUMP)
SUBMERSIBLE SBLH (VS) SERIES (HEAVY DUTY HIGH CHROME SLURRY PUMP)
Click on the applicable product line

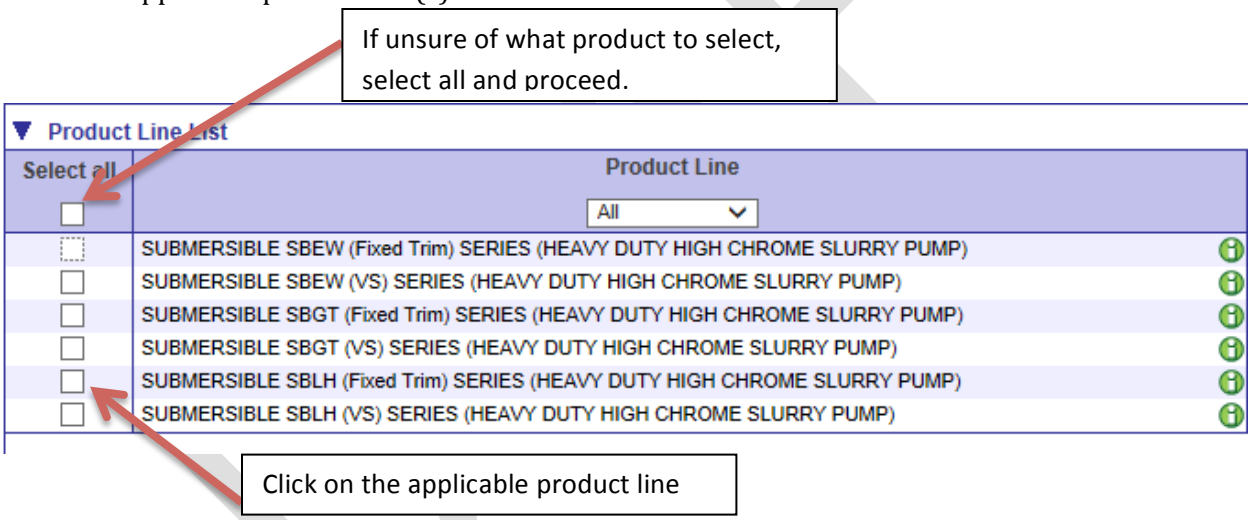
VS stands for variable speed option, only select if the customer is running or willing to run a VFD in the application.

Once the products are selected, click the next button: Next >>

Model Number Provided (No Conditions of Service)



Select the applicable product line(s):


If unsure of what product to select, select all and proceed.
Product Line List
Select all
Product Line
All
SUBMERSIBLE SBEW (Fixed Trim) SERIES (HEAVY DUTY HIGH CHROME SLURRY PUMP)
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SUBMERSIBLE SBGT (VS) SERIES (HEAVY DUTY HIGH CHROME SLURRY PUMP)
SUBMERSIBLE SBLH (Fixed Trim) SERIES (HEAVY DUTY HIGH CHROME SLURRY PUMP)
SUBMERSIBLE SBLH (VS) SERIES (HEAVY DUTY HIGH CHROME SLURRY PUMP)
Click on the applicable product line

VS stands for variable speed option, only select if the customer is running or willing to run a VFD in the application.

Once the products are selected, click the next button:

Units Frequency 60 Hz

Pump Size List: SUBMERSIBLE SBLH (Fixed Trim) SERIES (HEAVY DUTY HIGH CHROME SLURRY PUMP)

ID	Size	Speed, rated (rpm) at 60 Hz	
		Range	Rated
SBLH3-S-8	SBLH3SXX-XTX-8.0-S	1,800 to 1,200	1,800
SBLH3-S-10	SBLH3SXX-XTX-10.0-S	1,800 to 1,200	1,800
SBLH3-SA-8	SBLH3SXX-XTX-8.0-SA	1,800 to 1,200	1,800
SBLH3-SA-10	SBLH3SXX-XTX-10.0-SA	1,800 to 1,200	1,800
SBLH4-S-11	SBLH4SXX-XTX-11.0-S	1,800 to 1,200	1,800
SBLH4-S-13	SBLH4SXX-XTX-13.0-S	1,800 to 1,200	1,800
SBLH4-SA-11	SBLH4SXX-XTX-11-SA	1,800 to 1,200	1,800
SBLH4-SA-13	SBLH4SXX-XTX-13.0-SA	1,800 to 1,200	1,800
SBLH6-S-13	SBLH6SXX-XTX-13.0-S	1,800 to 1,200	1,800
SBLH6-S-15	SBLH6SXX-XTX-15.0-S	1,800 to 1,200	1,800
SBLH6-SA-13	SBLH6SXX-XTX-13-SA	1,800 to 1,200	1,800
SBLH6-SA-15	SBLH6SXX-XTX-15-SA	1,800 to 1,200	1,800
SBLH8-6T4-S-19.5	SBLH8S-XX-6TX-19.50-S	1,200 to 900	1,200
SBLH8-6T4-S-17.75	SBLH8S-XX-6TX-17.75-S	1,200 to 900	1,200
SBLH8-6T4-S-16.75	SBLH8S-XX-6TX-16.75-S	1,200 to 900	1,200
SBLH8-6T4-S-15.75	SBLH8S-XX-6TX-15.75-S	1,200 to 900	1,200
SBLHLS8S-6T4-S	SBLHLS8S-XX-6TX-19.50-S	1,200 to 900	1,200

Select model desired by clicking on the model number.

Select the desired speed that matches the customer's request

Comparing Search Results

Model number

Curve with condition point

This will compare the selected curves together

Units Hide Near Misses Advanced Sort

Results List - 500.0 USgpm @ 100.0 ft, 60 Hz | Thumbnail Curves (All)

Result	Size		Compare Thumbnail Curves	Stages	Speed criteria	Impeller diameter, rated	Head, rated (actual)	Speed, rated (rpm)	Actual flow (USgpm)
✓	SBGT4SXX-XTX-15.0		☐	1	Sync.	15.00	115.6	1,200	537.5
?	SBGT4SXX-XTX-14.0	Near Miss	☐	1	Sync.	14.00	98.02	1,200	495.0

Impeller diameter

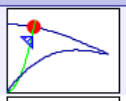
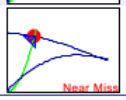
Rated Head

Rated Speed

Rated Flow

Units | Hide Near Misses | Advanced Sort

Results List - 500.0 USgpm @ 100.0 ft, 60 Hz | Thumbnail Curves (All)

Result	Size	Compare Thumbnail Curves	Stages	Speed criteria	Impeller diameter, rated	Head, rated (actual)	Speed, rated (rpm)	Actual flow (USgpm)
✓	SBGT4SXX-XTX-15.0 	☐	1	Sync.	15.00	115.6	1,200	537.5
?	SBGT4SXX-XTX-14.0  Near Miss	☐	1	Sync.	14.00	98.02	1,200	495.0

Synchronous or Variable

Pump Efficiency

Rated Power

Max Power

Pump Efficiency (%)	Power, rated (hp)	NPSHr (ft)	Max. Power (hp)	% BEP	% Max Diameter or Pitch	Price Index	Near Miss Reason
32.96	47.59	-	77.45	39.41	100.00	RFQ	
28.13	43.55	-	64.70	39.41	100.00	RFQ	Rated head above maximum impeller diameter.

Max. Power (hp)	% BEP	% Max Diameter or Pitch	Price Index

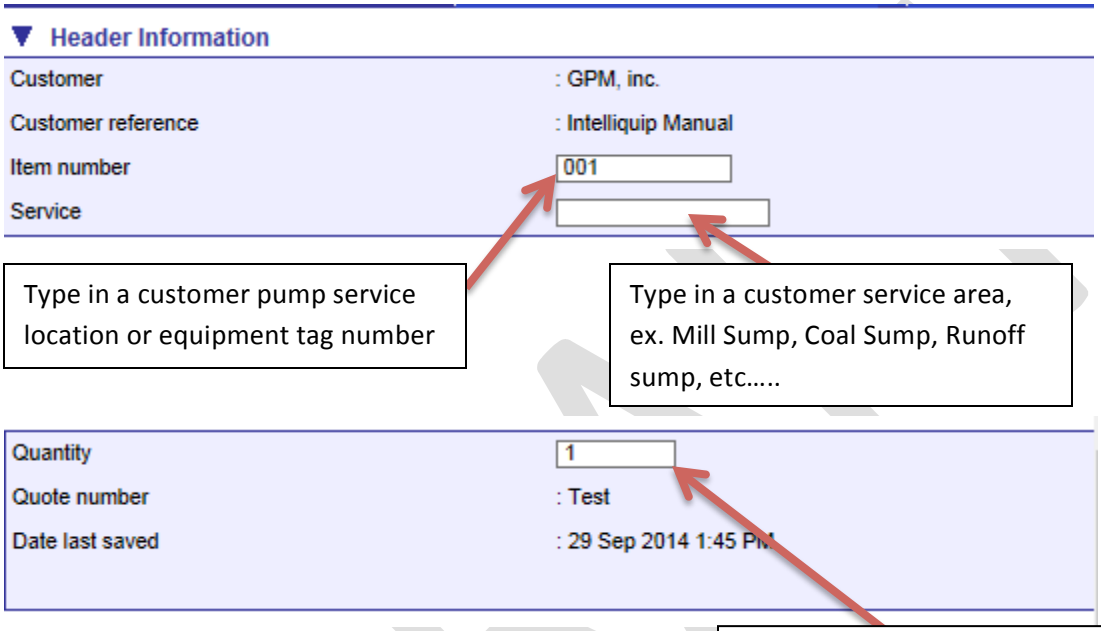
A user can easily sort the selections by clicking on one of the arrows; this will sort the displayed information in an organized fashion.

Reviewing the Desired Selection

Performance Data Sheet

The performance datasheet displays all the applicable information for the selection. There are a few items that need to be verified before moving onto the pump configuration level.

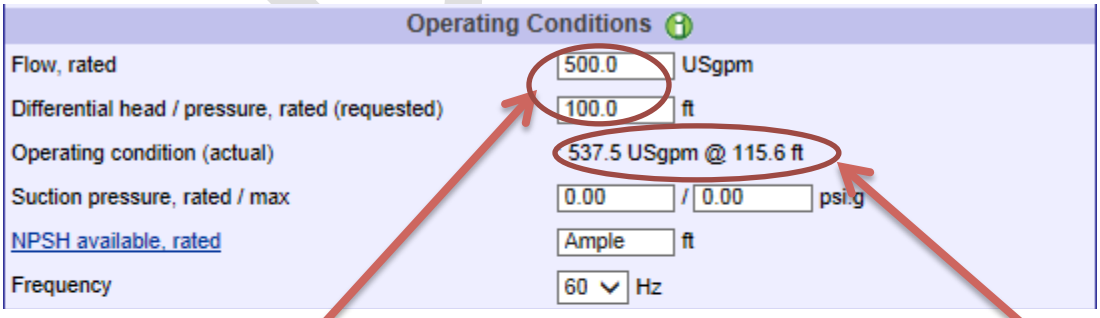
Header Information:



Type in a customer pump service location or equipment tag number

Type in a customer service area, ex. Mill Sump, Coal Sump, Runoff sump, etc.....

Input the quantity of pumps, note this will be applied to all options (elbows, hose, agitators, cable, etc…)



Desired conditions of service.

Actual conditions of service the selection will produce.

GPMEliminator
SOLID PUMPING SOLUTIONS

Performance		
Speed criteria		◉ Synchronous ○ Variable
Speed, rated	☑ set @	1,200 rpm
Impeller diameter, rated	☐ set @	15.00 in
Impeller diameter, maximum		: 15.00 in
Impeller diameter, minimum		: 15.00 in
Efficiency		: 32.96 %
NPSH required / margin required		: - / 0.00 ft
Ns (imp. eye flow) / Nss (imp. eye flow)		: N/A US Units
MCSF		: -
Head, maximum, rated diameter		: 122.3 ft
Head rise to shutoff		: 5.86 %
Flow, best eff. point (BEP)		: 1,363.8 USgpm
Flow ratio (rated / BEP)		: 39.41 %
Diameter ratio (rated / max)		: 100.00 %
Cutwater ratio (rated / cutwater)		: N/A
Head ratio (rated dia / max dia)		: 99.45 %
Solids diameter limit		: 3.00
Selection status		: Acceptable

Pump Speed

Impeller Diameter

Pump Efficiency

Pump BEP

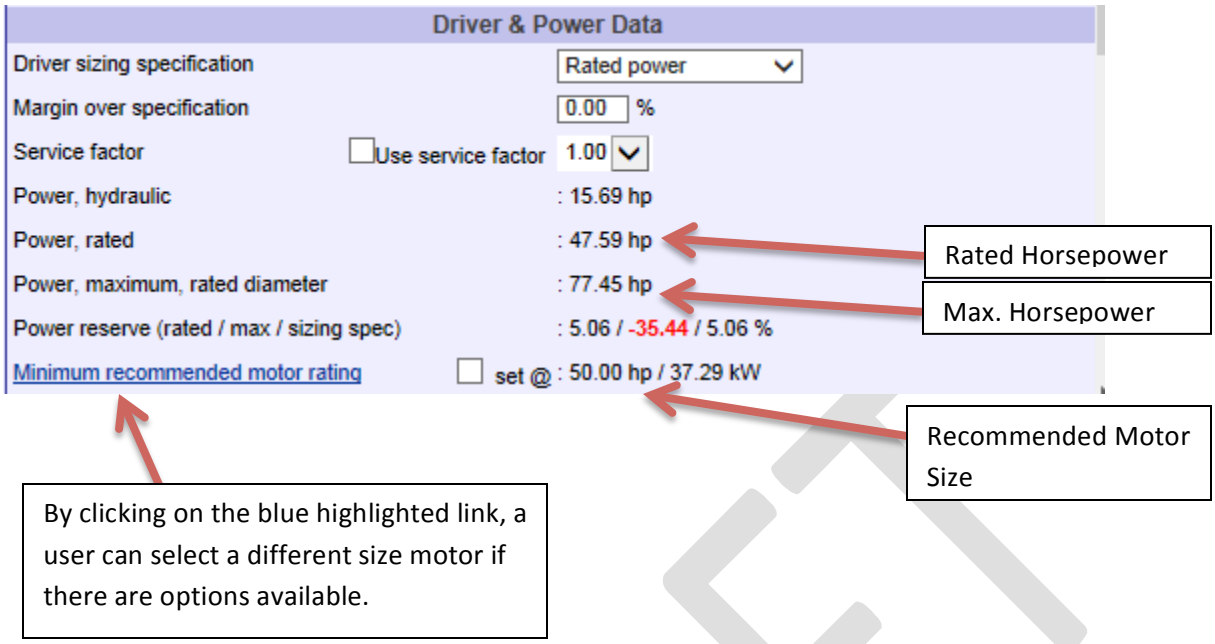
Maximum Solids Diameter

Based on curve number	: SBGT4S-6T4-S-15

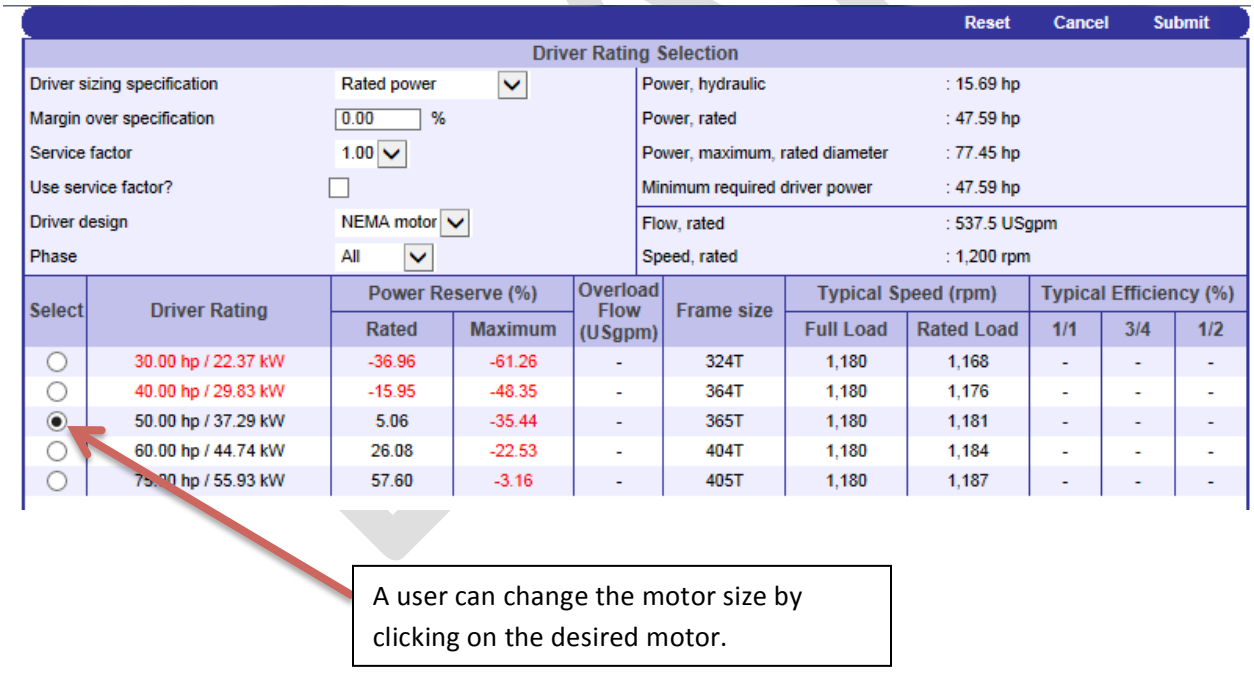
Curve Reference

Liquid	
Liquid type	: Water
Additional liquid description	
Solids diameter, max	0.00 in
Solids concentration, by volume	0.00 %
Temperature, max	68.00 deg F
Fluid density, rated / max	1.000 / 1.000 SG
Viscosity, rated	1.00 cP
Vapor pressure, rated	0.00 psi.a
Cq/Ch/Ce/Cn ANSI/HI 9.6.7-2010	: 1.00 / 1.00 / 1.00 / 1.00

Specific Gravity


Driver & Power Data
Driver sizing specification
Rated power
Margin over specification
0.00 %
Service factor
Use service factor
1.00
Power, hydraulic
: 15.69 hp
Power, rated
: 47.59 hp
Power, maximum, rated diameter
: 77.45 hp
Power reserve (rated / max / sizing spec)
: 5.06 / -35.44 / 5.06 %
Minimum recommended motor rating
set @
: 50.00 hp / 37.29 kW
Rated Horsepower
Max. Horsepower
Recommended Motor Size
By clicking on the blue highlighted link, a user can select a different size motor if there are options available.

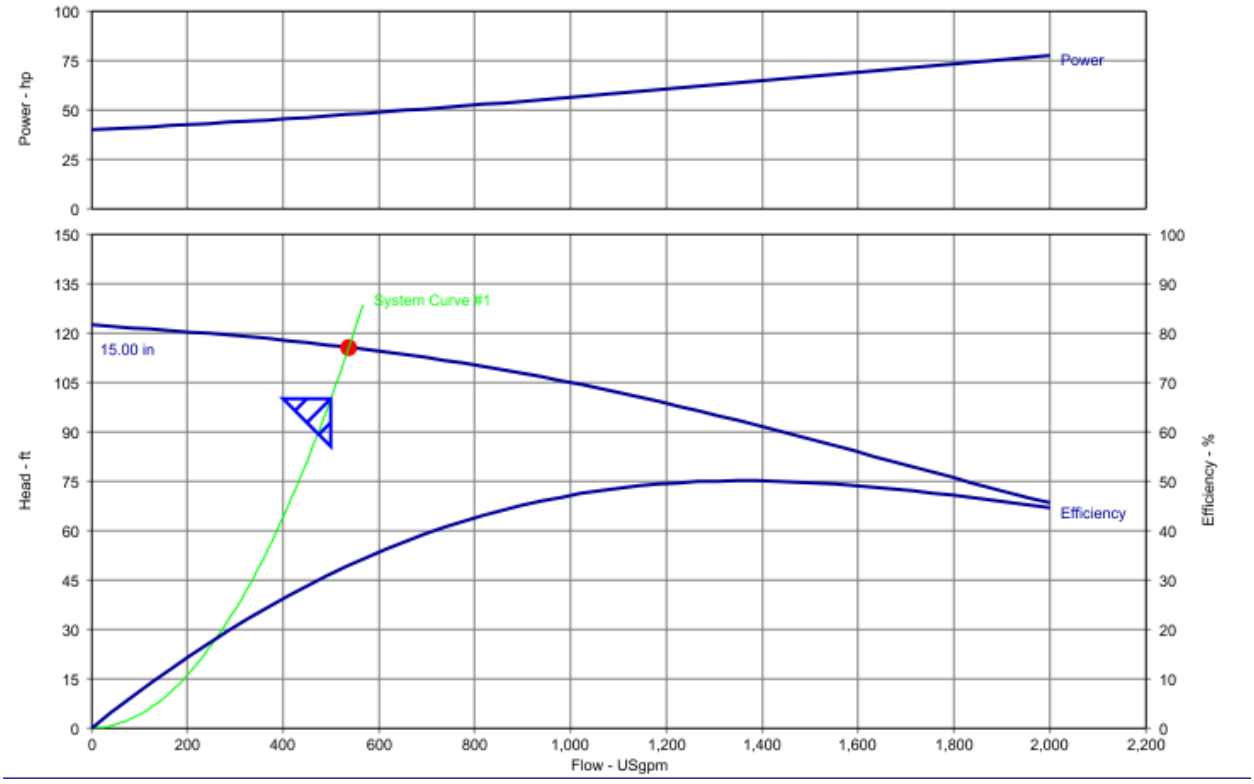
Selecting a different motor:


Reset
Cancel
Submit
Driver Rating Selection
Driver sizing specification
Rated power
Margin over specification
0.00 %
Service factor
1.00
Use service factor?
Driver design
NEMA motor
Phase
All
Power, hydraulic : 15.69 hp
Power, rated : 47.59 hp
Power, maximum, rated diameter : 77.45 hp
Minimum required driver power : 47.59 hp
Flow, rated : 537.5 USgpm
Speed, rated : 1,200 rpm
Select
Driver Rating
Power Reserve (%)
Rated
Maximum
Overload Flow (USgpm)
Frame size
Typical Speed (rpm)
Full Load
Rated Load
Typical Efficiency (%)
1/1
3/4
1/2
30.00 hp / 22.37 kW -36.96 -61.26 - 324T 1,180 1,168 - - -
40.00 hp / 29.83 kW -15.95 -48.35 - 364T 1,180 1,176 - - -
50.00 hp / 37.29 kW 5.06 -35.44 - 365T 1,180 1,181 - - -
60.00 hp / 44.74 kW 26.08 -22.53 - 404T 1,180 1,184 - - -
75.00 hp / 55.93 kW 57.60 -3.16 - 405T 1,180 1,187 - - -
A user can change the motor size by clicking on the desired motor.

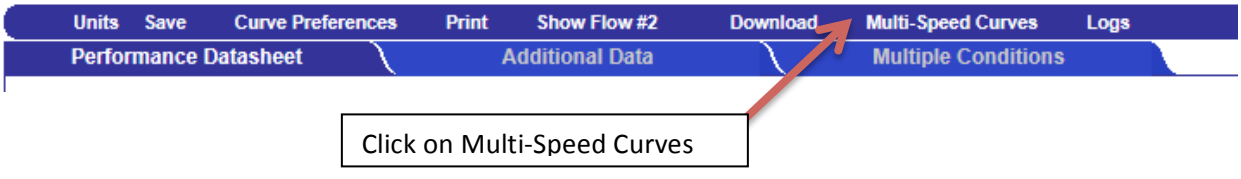
Once the user has selected the motor of choice for the application click on **Submit** and return back to the performance datasheet.

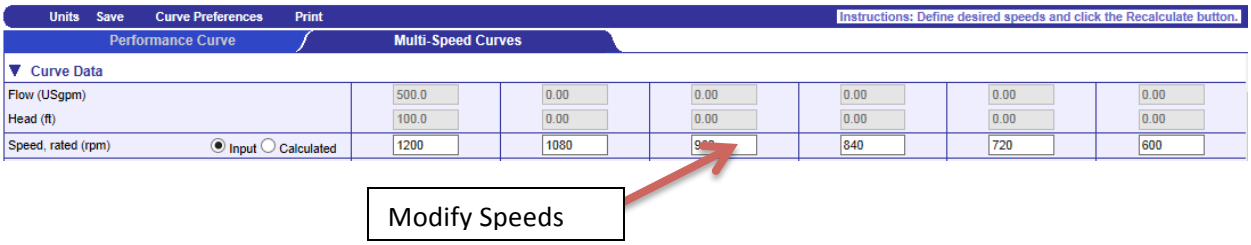
A user can look at the performance curve to verify the product is the best fit for the application. A few items to understand:

1- The Green line is the system curve (see below if no system curve is displayed), this will be displayed under 2 different scenarios:
   a. If the user has input the information into the Head Loss module
   b. It will default to 0 and use the conditions of service supplied by the user
2- The Blue dashed triangle is the desired condition point that was put int o the system to size a pump.
3- The red dot is the actual condition point at which the selection will operate at within the customers system.

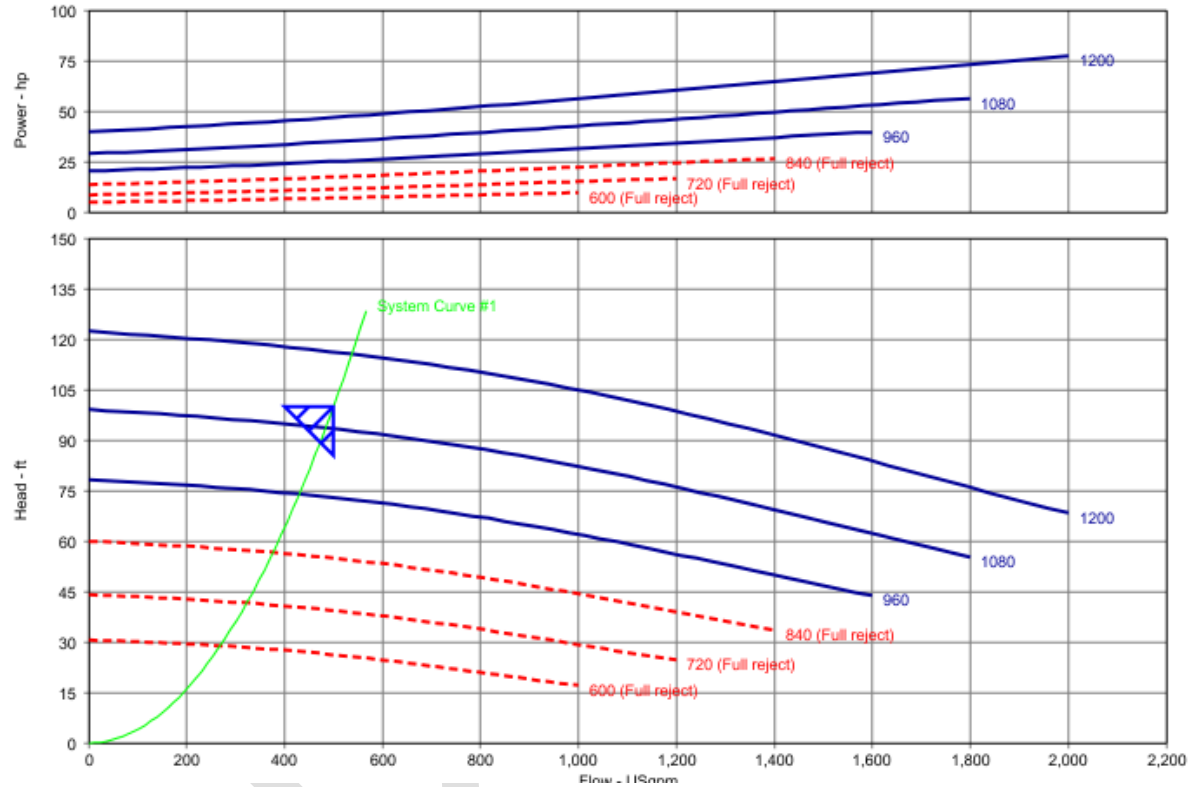


Multi-Speed Curve





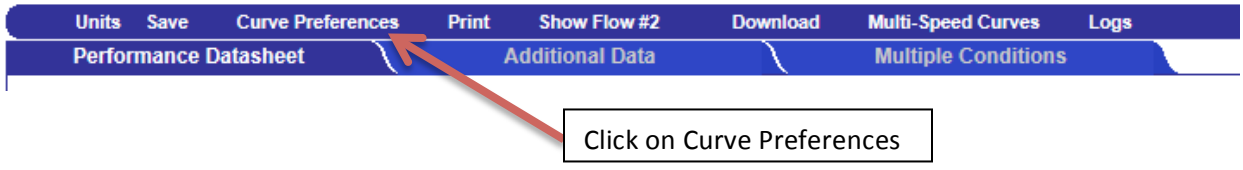
Speeds on the multi-speed curve default to synchronous speeds, however the user may change those speed to reflect an existing condition if it is desired.



Example of a multi speed curve

System Curve Display

Setting up the display of a system curve


Units Save Curve Preferences Print Show Flow #2 Download Multi-Speed Curves Logs
Performance Datasheet
Additional Data
Multiple Conditions
Click on Curve Preferences

A window will pop open that will look like this:

Submit Cancel Reset Defaults

General Preferences | Curve Preferences | Unit Preferences

Pump Performance Curve Content									
Properties	Head	Efficiency	NPSHr 3% head drop	Sub.	Power Shaft (P2)	Power Input (P1)	MCSF	Max allowable flow	Minimum thermal flow
None	○	○	○	○	○	◉	○	○	○
Rated curve only	○	◉	◉	◉	◉	○	-	-	-
Rated, min & max curve.	◉	-	-	-	-	-	-	-	-
Rated and all catalog curves	○	○	○	-	○	○	-	-	-
ISO lines	-	○	-	-	○	-	◉	◉	◉
Non viscous	☐	☐	-	-	☐	-	-	-	-
Position, curve label	Left	None	None	None	None	None	-	-	-
Display rated flow duty point	-	☐	☐	☐	☐	☐	-	-	-
Chart position	Middle	-	Bottom		Top		-	-	-
Vertical Pumps									
Pump performance calculation	☐ Account for static lift from LLL to discharge nozzle centerline (in addition to friction losses and power losses) when calculating pump performance from bowl								
Curve display options	◉ Pump performance ○ Bowl performance ○ Pump and bowl performance								
Duty Point, Primary	◉ Head, rated (requested) ○ Bowl head ○ Pump head								

Preferred operating region		
Properties	Left of BEP	Right of BEP
Percent of BEP	70.00	120.00
Display?	☐	

Scroll down within the open window until System Curves is displayed.

System Curves				
Properties	Curve #1	Curve #2	Curve #3	Curve #4
Static head (ft)	0.00			
Flow (USgpm)	☐ set @ 500.0			
Head (ft)	☐ set @ 100.0			
Label	System Curve 1			
Display?	☑	☐	☐	☐

Click in this box so a check mark is displayed

Additional system curves can be displayed by typing in the applicable information within each column, up to 4 curves can be displayed on the performance curve.

Once the user has completed the system curves, click **Submit** and return back to the performance data sheet.